

ANNUAL SISYRINCHIUMS (IRIDACEAE) IN THE UNITED STATES

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Only three annual species of *Sisyrinchium* occur in the United States. It is thoroughly characteristic of the elusiveness of taxonomic characters in the genus that one of them (*S. rosulatum*) is sometimes perennial. The major area for all three is in eastern Texas and Louisiana. There one of them (*S. minus*) is native, but it has been introduced into California and North Carolina, and abroad into Argentina and Uruguay. The other two are natives of temperate South America which were introduced into the Southern United States (and elsewhere around the world) beginning in the middle or latter part of the 19th Century, but did not become well established and common until relatively recent times. These two hybridize readily in their new home, as apparently is true also in the areas where they occur together as natives in South America. Nevertheless they appear to be maintaining their identities as separate species. There has been no indication of crossing between the two aliens and the native *S. minus*, a fact now made readily understandable by Oliver and Lewis's report (1962) of the haploid chromosome numbers: 16 in each of the two aliens, 5 in *S. minus*.

The species and hybrids are all easily recognized from the colors of the fresh flowers, but such information is grievously lacking with most herbarium specimens. This account is based primarily on my own extensive field observations and collections made from Texas to northern Florida, in large part (1956-1961) under a grant from the National Science Foundation for preliminary field work toward a flora of the Gulf Southwest. An extended tour of the Northeastern States during the winter of 1945-1946, and shorter trips at intervals since, have enabled me to examine types and other specimens at the Chicago Natural History Museum (Field Museum), the Gray Herbarium, the Missouri Botanical Garden, the New York Botanical Garden, the University of Texas, Texas A. & M. College, Tulane University, the United States National Herbarium, and the United States National Arboretum Herbarium, as well as Southern Methodist University. I am indebted to the many curators and librarians (several now deceased) who so kindly made their facilities available during my visits. Most recently I have to thank Dr. Robert L. Wilbur for the loan of collections from the Duke University Herbarium; Dr. George B. Van Schaack, of the Missouri Botanical Garden, for a copy of the original description of *S. validianum*; and Prof. J. Leandri, of the Paris Museum, for notes and a photograph of the type of *S. micranthum*.

Despite the sometimes perennial habit of *S. rosulatum* the three an-

nual species are generally easily recognized as such, and it takes but little experience to be able to distinguish them on sight from the more numerous perennial ones. Apart from intangible features of general appearance, their gamut of flower colors is almost completely different from that of the perennials, excepting a few Far-Western ones. Only the uncommon albino form of *S. minus* (white with yellow eye) duplicates what may appear in the perennials. The latter (all those in the South and East, a majority of those in the West) have medium to large perianth ranging from white to light blue, deep violet-blue, or even purplish blue (but still decidedly on the blue side), with yellow eye. The annuals never have a distinctly blue perianth (though often bluish or greenish in withering), the colors ranging from pinkish lavender to rosy purple (often partly or largely white with eye-ring and stripes) to yellow, and in the hybrids to various shades of brownish purple or purple-red (see key below and notes on hybrids at end). Taxonomically these form an artificial group, but it is convenient to treat them together.

KEY TO THE ANNUAL SPECIES

- 1a. Ovary and capsule oblong-ellipsoid or oblong-pyriform, more than 1½ times as long as broad; stamens well exerted, about half the length of the perianth; perianth variously lavender-pink to purple-rose, white with yellow eye, or all yellow.....1. *S. minus*
- 1b. Ovary and capsule globose or subglobose, shorter to barely longer than broad; stamens barely or not exerted, 1/6—1/3 as long as the perianth; perianth variously colored (see next couplet), but never just as in the preceding (following two species hybridize freely; see remarks at end of text).
- 2a. Perianth yellow with brown-red eye ring and often a single brown-red center line on each lobe; length (half-width) of perianth 5—10 mm.; diameter of capsule 2.7—3.5 mm.....2. *S. exile*
- 2b. Perianth white to lavender-pink or bluish-purple-tinged, with yellow eye circled by rose-purple eye ring and commonly three (but sometimes one, or none, or more) lines or stripes down each lobe; length (half-width) of perianth 9—16 mm.; diameter of capsule 3.0—4.2 mm.....3. *S. rosulatum*

1. *S. MINUS* Engelmann & Gray, Pl. Lindh. p. 55 (Boston Journ. Nat. Hist. 5: 263). 1845. "Margin of pools, &c. in the prairie west of San Felipe," Austin Co., Texas, *Lindheimer Fl. Tex. Exs.* 313, April, 1844 (holotype GH, isotypes MO, SMU). — *S. flexuosum* Rafinesque, Aut. Bot. p. 65. 1840. "Arkansas and Texas." Not *S. flexuosum* (L.) Sprengel, Syst. 1: 167, 1825. — *S. Bermudiana* var. *minus* (Englemann & Gray) Klatt, Linnaea 31:69. 1861. — *S. Thurowii* Coulter & Fisher, Bot. Gaz. 17: 352. 1892. "Hockley, Texas" (Harris Co.), *Thurow* (holotype F; a rare yellow-flowered form). — *S. Canbyi* Bicknell, Bull. Torr. Bot. Club 28: 588—589. 1901. Holotype: Columbia, Brazoria Co., Texas, Wm. M. Canby 238, 25 March 1900 (NY). To my eye the perianth on the type is

rosy lavender, not "bright purplish blue" as described by Bicknell. — The name *S. geniculatum* Herbert is given as a synonym of this by Baker and Johnston, but I do not believe this is correct (see remarks in list of doubtful or excluded names at end).

The usual perianth color in this species is a distinctive purple-rose (in my notes I find I most often called it magenta-rose) which is quite uniform, except for being occasionally lighter or darker than usual; rarely it is pale enough to be called lavender-pink. There is not a continuous series of intermediates between this and the other two color forms, which are even more uniform. White is occasional and widespread, usually few individuals among many of the typical form, rarely in reverse proportions, or by itself. The yellow form I have found only once (at Needville, Fort Bend Co., Texas), growing with and less common than the typical form. The type of *S. Thurowii* is the only other record of the yellow known to me.

These color forms are highly significant in relation to the evolution of the Texas flora. They are clearly due to spontaneous mutation, not to introgression, since the chromosome number is unique in the genus. Such mutation I believe is occurring now and has long occurred, and is sufficient by itself to explain the origin of many of our existing species and varieties. It would be of great interest to know the precise details of the inheritance of color forms, and in particular why there are no intermediates. As for survival value, to try to read anything of the sort into these variations is to indulge in wild fantasy. At least two of the forms are successful in invading new territory. The third is so rare that it has so far given no indication of spreading, but this proves nothing about its future.

Because it was first found in Texas in natural habitats, and for long was known only from there and adjacent Oklahoma (Rafinesque's "Arkansas"; see remarks below on distribution), I believe the species is native to this area. Its weedy behavior is shared by numerous species indubitably native. From its habitats, and the recency of the records, I believe that in Louisiana it is largely introduced. It is unquestionably an introduction in California and North Carolina, and I have no doubt that the same is true of its occurrence in Argentina and Uruguay (reported by Johnston, 1938).

Rafinesque reported this species from both Texas and "Arkansas." Like Nuttall's "Arkansa," the latter term referred to the old Arkansas Territory, which included eastern Oklahoma. Although Waterfall does not include *S. minus* in his catalogue of the Oklahoma flora (1952), it is not at all unlikely that the species once occurred there; it has long been common as far north as Dallas, Texas. All the United States collections I have seen from outside Texas are cited below. For the latter state I have merely listed the counties from which it is known. Since the publication of my 1948 map, it has been found as a roadside weed in Montgomery and Tyler counties, and introduced with *St.*

Augustine grass sod in Nacogdoches County, all east of the area shown on the map.

CALIFORNIA. Los Angeles Co.: in grassy field dominated by *Phalaris Lemmoni*; Sepulveda Blvd., northwest of Los Angeles airport, *Frank W. Gould 2287*, 15 April 1944 (SMU). "Flowers white." (Distributed as *S. bellum* var.) LOUISIANA. Grant Parish: 4.6 miles southeast of Colfax (from road junction on U.S. Highway 71), road shoulder, *Shinners 29,510*, 18 April 1962 (SMU). "Perianth magenta-rose (white on one plant)." Madison Parish: 2.8 miles west of Waverly, foot of road fill by creek, *Shinners 28,221*, 18 April 1960 (SMU). "Perianth white with yellow eye." Same locality and date, *Shinners 28,240* (SMU). "One plant with magenta-rose perianth (all others seen white)." Natchitoches Parish: Natchitoches, swampy open ground, *E. J. Palmer 7486*, 3 May 1915 (MO). Red River Parish: 1.4 miles west of Grand Bayou, road fill, *Shinners 27,227*, 22 April 1958 (SMU). "Perianth purple-rose; lobes several-stripped on back." St. Martin Parish: 1.8 miles south of Parks, dried-up ditch, *Shinners 28,128*, 16 April 1960 (SMU). "One plant only." Tensas Parish: 3 miles north of Helens, margin of swamp forest, hardwoods, *J. Ewan 19054*, 20 April 1957 (NO). "Flowers very pale pink, mostly past." NORTH CAROLINA. Durham Co.: Duke campus, waste places, *W. B. Davis 819*, 17 May 1932 (DUKE). TEXAS. Aransas, Atascosa, Austin, Bastrop, Bee, Bell, Brazoria, Brazos, Dallas, Dimmit, Falls, Fort Bend, Harris, Karnes, Kleberg, Liberty, Llano, Matagorda, Montgomery, Nacogdoches, Navarro, Nueces, Robertson, San Patricio, Travis, Trinity, Tyler, Williamson; also "Seguin—Lavernia (Guadalupe or Wilson Co.), "Victoria—Goliad" (counties with same names).

2. *S. EXILE* Bicknell, Bull. Torr. Bot. Club 28: 573—574. 1901. "Sandy sea shores at Galveston," Galveston Co., Texas, *J. E. Bodin*, 25 February 1890, "herb. Univ. of Minn. and U.S. Nat. herb." (latter specimen examined). — *S. Brownii* (sphalm. *Brownei*) Small, ex Small & Alexander, Bot. Interpr. Iridaceous Pl. Gulf States (Contrib. New York Bot. Gard. 327): 330. 1931. ("Excerpt from the forthcoming Manual of the Flora of the Southeastern United States.") Not designated in the list of new binomials (unnumbered page at end), and no type indicated; noted only as "S E La." It was in fact named in honor of Prof. Clair A. Brown of Louisiana State University. For unknown reasons I find no notes on the type from my New York visit in 1946, but the description leaves no doubt as to the identity of the plant. I did examine the following later collection at New York. LOUISIANA, Livingston Parish: roadside, pine land near Hammond, *C. A. Brown 3846*, 9 April 1932. "Flowers yellow, purple brown line on inside of petals." — This is *S. micranthum* of many authors (see doubtful and excluded names at end).

In flower color this is rather uniform, the chief variation being the extent to which the brown-red eye ring extends as a thin line down each perianth segment. Predominantly the perianth is medium yellow, very rarely pale or sulfur yellow. The species is now a common and

often abundant weed of sandy road shoulders and damp sandy ground along highways in southeastern Texas and Louisiana, and has spread north into Arkansas. East of the Mississippi River it is still largely restricted to areas near the Gulf, chiefly in northern Florida, but it occurs as a lawn weed as far northeast as Statesboro, Bulloch Co., Georgia (Gordon P. DeWolf, in letter). I was surprised in tabulating the records to find none for Alabama. I feel certain that it occurs there, but I failed to collect it in several trips to the three southernmost counties made with *Sisyrinchium* particularly in mind. State and county (parish) records are as follows.

ARKANSAS. Bradley, Union. (Also Drew, according to Moore, 1958.) FLORIDA. Clay, Jackson, Polk, St. Johns. (Also Washington, on basis of hybrids; see detailed notes on these at end.) LOUISIANA. Acadia, Allen, Beauregard, Bienville, Calcasieu, Jackson, Lafayette, La Salle, Livingston, Natchitoches, Rapides, Sabine, St. Helena, St. Tammany, Vermilion, Vernon, West Feliciana, Winn. (Also Evangeline, Jefferson Davis, on basis of hybrids.) MISSISSIPPI. Pearl River. TEXAS. Angelina, Austin, Chambers, Galveston, Hardin, Harris, Jasper, Jefferson, Liberty, Montgomery, Newton, Panola, Polk, Rains, Robertson, Sabine, Shelby, Trinity.

Apparently the first collection of this species from the United States was made in Texas by Elihu Hal, probably in 1872. There is a specimen at the Gray Herbarium with no data except "flowers yellow," the collector's name, and that of the state. Hall collected at various central Texas localities from the coast inland to Austin and Dallas. He may well have found the plant at Galveston, where Bodin later collected the type of *S. exile*. One possible means of introduction for both this species and *S. rosulatum* is suggested by an incident reported in Wini- fred Kimball's reminiscences of Chapman, occurring some time after 1887. "When a South American ship brought up clay from the 'Rio de la Plata' as ballast, and my father had it spread over the garden, Doctor Chapman's interest grew apace. He watched over each new 'weed' that cropped up." There are specimens in the Gray Herbarium from Easter Island (collected in 1904), Fiji (Viti Levu, 1927), Hawaii (Hawaii National Park, 1943) and Australia (Queensland, 1943). The original home of this now very widespread weed seems to have been in the region from southern Brazil to northern Argentina. Since 1820, at least, the name *S. micranthum* has been used for the plant here discussed. The following remarks by John Sims, accompanying the illustration of it under that name in Curtis's Botanical Magazine (47: t. 2116, 1820) are worth quoting. "We find no account of this plant but what has been derived from the description and figure above quoted, which were taken from a solitary dried specimen in Jussieu's herbarium, collected in Peru. Communicated in July last by Mr. Anderson, of the Botanic Garden at Chelsea; to whom it was sent by Mr. Otto, from the Royal Botanical Garden at Berlin."

3. *S. ROSULATUM* Bicknell, Bull. Torr. Bot. Club 26: 228—229. 1899. "Dry open places in sandy soil, coast of South Carolina and Alabama. South Carolina: Sullivan's Island (Charleston Co.), May 8, 1852, Professor Lewis B. Gibbes. Alabama: Mobile, April 6, 1896, May 5, 1896. Dr. Charles Mohr." (Mohr specimens examined, US.) Bicknell states "flowers not seen, reported to me by Dr. Mohr as being of a reddish purple or wine color." — This is *S. laxum* in the sense of I. M. Johnston, 1938; not *S. laxum* Otto ex Sims (see doubtful or excluded names at end). Duplicates of my collection down to 1962 were all distributed under this name.

Apart from the evident hybrids discussed below, there is great variation in flower color in this species, especially in pattern, which I believe indicates spontaneous genetic diversity rather than introgression. The perianth is rather large and showy, commonly white with varying amounts of rose-purple in the form of an eye ring and lines down the segments, but occasionally colored throughout. It is also more variable in stature than *S. exile*. My observations confirm Johnston's statement that it is the more variable of the two species. He suggested that hybridization might be responsible for certain plants "which present embarrassing combinations of character." This is certainly the case in Florida, Louisiana, and Texas. *S. rosulatum* in the United States occupies much the same area as *S. exile*. In Texas it is much less common, but in Alabama and Mississippi it is more so, than the yellow-flowered species.

ALABAMA. Baldwin, Mobile, Washington. ARKANSAS. Union. (Also Ashley, Bradley, Drew, according to Moore, 1958.) FLORIDA. Escambia, Jackson, Jefferson, Washington. LOUISIANA. Acadia, Allen, Beauregard, Bienville, Bossier, Calcasieu, Caldwell, Catahoula, Grant, Jackson, La Salle, Madison, Morehouse, Rapides, St. Helena, St. Mary, Winn. (Also Evangeline, Jefferson Davis, Vernon, on basis of hybrids.) MISSISSIPPI. Claiborne, Rankin. NORTH CAROLINA. Brunswick. SOUTH CAROLINA. Charleston. (Syntype of the species; no recent collections seen.) TEXAS. Angelina, Jasper, Jefferson, Nacogdoches, Newton, Tyler. (Also Polk, Trinity, on basis of hybrids.)

The oldest collections from the United States were those from South Carolina (1852) and Alabama (1896) on which Bicknell based the species. It was found in "open fields, Richland," presumably St. Mary Parish, Louisiana, by R. S. Cocks in June, 1908 (NO). But most of its North American range has been attained more recently. When I began field work in the Gulf States in 1945, it was rare in southeastern Texas (I found it only in Jefferson County); now it is frequent there. In Louisiana and eastward it is generally as common as *S. exile* or more so; certainly it is much more conspicuous. Its original home was nearly the same as that of *S. exile*, from southern Brazil to Argentina. Whether Johnston's report of *S. laxum* from Europe refers to this species or the true *S. laxum* I do not know.

2 X 3. *S. EXILE* X *ROSULATUM*. The binomial *S. Metae* Herter probably was based on a nothomorph of this cross (see under doubtful or excluded names at end). In Louisiana intermediates between the species are rather common (elsewhere they are much less so), nearly always in association with the parents, the majority appearing to be first-generation hybrids, while apparent back-crosses or second-generation segregates are rather uncommon. Below are cited 15 collections representing such intermediates, with notes on perianth color. All are deposited at SMU, and all but the last one were collected by myself.

FLORIDA. Washington Co.: 1.8 miles east of Shipley, 27,009. "White with chocolate-red central ring; lobes with slender dorsal central line." LOUISIANA. Allen Parish: 3.2 miles northwest of Oakdale, 23,043. "Light brownish mauve with light yellow eye; tepals with single darker central stripe." Same locality, 23,068. "Medium large, light yellow. Growing with *S. micranthum* (i.e. *exile*), 2 color forms of *S. laxum* (i.e. *rosulatum*), unidentified intermediate type, 1 plant with large, pale yellow, lined perianth." Same locality, 23,069. "Large, pale yellow with dark lines," growing with preceding. Beauregard Parish: 0.5 mile north of Ragley, 23,665. "Garnet, tepals with darker base and central line." — 3.7 miles south of Longville, 23,543. "With yellow eye, tepals scarlet-mauve at base and center." Calcasieu Parish: 4 miles south of Gillis, 23,153. "Smaller than in *S. laxum* (i.e. *rosulatum*), mauve with scarlet tinge, lobes with single dark central stripe." Evangeline Parish: 8.5 miles east-southeast of Oakdale, 27,970. "Withered (2 P.M.), tube yellow." Jefferson Davis Parish: 5.1 miles southeast of Jennings, 23,140. "Light scarlet-mauve, tepals with dark central line." Rapides Parish: 2.5 miles northeast of Glenmora, 23,255. "Medium large, mauve with scarlet tinge." Vernon Parish: 2.3 miles northwest of Leesville, 22,753. "Smaller than in *S. laxum* (i.e. *rosulatum*), white with mauve ring around yellow eye." — 2.2 miles northwest of Anacoco, 23,673. "Brownish mauve, tepals darker at base and down center." Winn Parish: 7.5 miles north of Winnfield, 23,342. "Scarlet-mauve." TEXAS. Polk Co.: 2 miles east of Livingston, 23,488. "Perianth 1/3 larger than in associated *S. micranthum* (i.e. *exile*), tepals brownish mauve, darker down center and at base." Trinity Co.: 1 mile west of Neches River, *R. L. Oliver* 312. "Light yellow with yellow center; outside base mauve-brown and along veins"; perianth as large as in typical *S. rosulatum*.

During April and May of 1956, when a majority of the above collections were made, the presumed first-generation hybrids (with perianth of intermediate size, of distinctive scarlet-mauve or brownish-mauve color unlike any forms of the parents, with a single central line on each segment) were very common and remarkably uniform. In subsequent years they have been much less plentiful. There is no indication that the two species are becoming completely mongrelized. On the contrary, they appear to be retaining their separate identities to an astonishing degree. Whatever mechanism or mechanisms served to maintain the

two in their native area evidently continues to operate in their new home. I have seen no evidence of crossing between an annual and a native perennial species, though there is evident hybridization among several of the latter (see comments in my *Spring Flora of the Dallas-Fort Worth Area, Texas*, 1958).

I have made no attempt to grow these plants or try artificial crosses. Much intensive genetical and doubtless chemotaxonomic work could be done on them, with a large staff of assistants, numerous graduate students (possibilities of several Ph.D. theses at least), and a succession of research grants, each larger than the one I received for work on the entire flora of the Gulf Southwest. Having committed myself to general flora work in an enormous area where it is desperately needed, I have no time for such things. To anyone trying to view the development of American botany in some reasonable scientific and historical perspective, it is all food for some very melancholy thoughts.

DOUBTFUL OR EXCLUDED NAMES

All the botanists who have done revisionary work including the three annuals (Klatt, Baker, Bicknell, Johnston, Foster) knew the plants only from herbarium specimens. But *Sisyrinchium* simply is not a genus that can be worked out solely in the herbarium. I have no acquaintance with the South American species other than the two introduced ones, but feel sufficiently well acquainted with the two to know the limits of their variation, and to reject all of the names referred to them in Johnston's really very creditable revision.

S. geniculatum Herbert, Edward's Bot. Reg. 1843 Misc. p. 84. Placed under the heading "Columnnea staminea cylindrica," the entire description is as follows. "5. Genuculatum, mihi; ex prov. Texas dicto, parva caule genuculato perianthio limbo laete coeruleo." This is listed by Johnston as "nomen" only, in the synonymy of *S. minus*. Earlier Baker had indicated like identity by citing it under *S. Bermudiana* L. "Var. 3. S. GENICULATUM Herb.," with *S. minus* as synonym. There is enough description in the original publication so that it must be regarded as validly published, even though what was said is, for this genus, all but useless for identification. If indeed identical with *S. minus*, its name would have to be adopted for that species, being two years older, unless its still older appearance as *nomen nudum* in association with a Brazilian plant can be taken as grounds for rejecting it as a *nomen confusum*. The description of the perianth as "limbo laete coeruleo" certainly does not fit any of the known color forms of *S. minus*, but would apply very well to *S. pruinosum* and other native perennials of Texas. It is very probable that Herbert had a Drummond collection, and Drummond unhappily worked in a veritable hot-bed of complex forms, introgressive hybrids, and what not involving the abundant native perennials of south-central Texas. Whether *S. geniculatum* could be satisfactorily identified even with a type specimen at

hand is doubtful at best. Things are complicated by the fact that the name did appear in print a year before the species was described, and it was then associated with a Brazilian species which according to Johnston was *S. laxum* (i.e. *S. rosulatum*). This first appearance was in "Contributions towards a flora of Brazil," by Gardner, in London Journ. Bot. 1: 538, 1842. The account there is as follows: "217. *Sisyrinchium geniculatum*. Herbert Mss. in Herb. Hook. HAB. In moist sandy places at Tejuca. Fl. Nov." The use of the plural "Mss." implies that Herbert annotated several specimens with this name, but as it was published the following year for a Texas plant, Brazilian material was by implication excluded by Herbert himself.

S. laxum Otto ex Sims, Bot. Mag. 49: 2312. 1882. "This new species of SISYRINCHIUM was introduced into the Chelsea garden in 1820, by Mr. Otto, curator of the Berlin Botanical Garden, under the name which we have adopted. . . . Communicated by Mr. Anderson of the Chelsea garden, who has treated it as an alpine, and it has survived the last winter exposed to the open air. Native country unknown." The plate, which must stand as the type for this species, shows the top of a plant only. The flowers appear relatively small in proportion to the very large capsules; the perianth is whitish with dark purple lines (the description says only "white-streaked"), quite similar to *S. rosulatum* except that the lines are uniformly very thin all the way down to the very narrow eye ring (in *S. rosulatum* they widen toward base, and the eye ring is usually very prominent). Light was shed on the identity of the plant figured by Sims when I received an unidentified specimen from New Zealand, though I did not at first realize it. The specimen is M. B. Ashwin 530, from Lower Hutt, Wellington, North Id., 3 Nov. 1958 (SMU). "Forming small tufts in dry ground by roadside. Introduced weed." Most unfortunately flower color is not noted, but the dried perianth shows the uniformly thin lines exactly as in Sims's plate. In other respects, especially the very large capsules, the specimen is an almost perfect match for the plate, which evidently represented the plant exactly in life size. The larger capsules on the specimen are 6 mm. in diameter (the larger one in the plate is 8 mm.), much too large for *S. rosulatum*. The perianth in the New Zealand specimen is 15 mm. long as pressed, the whole plants (two on the sheet) coarser than even robust forms of *S. rosulatum*, and the roots are noticeably stouter and tougher. I take the New Zealand specimen to be the true *S. laxum*, but have seen no others to match it. Its native country is still unknown, though presumably it is South American.

S. Metae Herter, Revista Sudamericana de Botanica 5: 28. 1937. Johnston places this in the synonymy of *S. laxum* (1938, p. 391), but Herter describes it as having white flowers, the tepals 3—5 mm. long (too small for either *S. laxum* or *S. rosulatum*), and lacking the purple coloring of those species. I strongly suspect that it is a hybrid form, quite probably involving *S. exile*, but since still other species not

familiar to me occur in Uruguay and might hybridize with *S. exile* or *S. rosulatum*, I cannot decide this point. Anyone wishing to adopt a binomial for the hybrids would have to settle the identity of *S. Metae* and other names placed in synonymy by Johnston.

S. micranthum Cavanilles, 6ta Dissertatio Botanica p. 345; pl. 191, fig. 2. 1788. "Habitat in Peru: examinatum ibi a D. Josepho de Jussieu. V. *S. unicum exemplar apud eius nepotem.*" Neither description nor figure is conclusive. Flower color unfortunately is not mentioned. A photograph of the type reveals that the drawing was crudely made, but the specimen itself is immature, and no great help either. It is erect and densely leafy. Prof. Leandri very kindly compared with it some small plants of *S. exile* which I had collected in St. Helena Parish, Louisiana, and reports that they seem to belong to the same species, but that on the Jussieu specimen "les racines sont toutefois un peu plus fortes." This is exactly a distinction just noted between *S. laxum* and *S. rosulatum*. Chiefly on the basis of general appearance, nature of the roots, and geographic location, I believe that the true *S. micranthum* is not the now cosmopolitan annual which has so long passed under that name, but a closely related species, perhaps perennial, of highland regions in western and northern South America. I believe Johnston was correct in making *S. iridifolium* H.B.K. (from Venezuela) a synonym of *S. micranthum*; probably *S. scabrum* Schlechtendal & Chamisso is also the same. These plants will have to be studied in the field by someone who also knows *S. exile* in a living state.

S. Pearcei Philippi, Linnaea 33: 251. 1864—1865. Listed by Johnston with query as synonym of *S. laxum*. The original description states that the perianth is yellow, so that it cannot be either *S. laxum* or *S. rosulatum*; it may well belong to the true *S. micranthum*.

S. uniflorum Gay ex Philippi, Linnaea 29: 63. 1857. Listed by Johnston as synonym of *S. laxum*. In the original description the word "caerulei" (sky-blue) is applied to the perianth, and the plant is compared with the blue-flowered *S. chilense*, differing in having scabrous stem. Neither color nor stem indument apply to *S. laxum* or *S. rosulatum*.

S. valdivianum Philippi, Anal. Univ. Chile 91: 616—617. 1895. Despite the length of the description, not much of real help appears in it. The capsule is described as 4—5 mm. in diameter, and on this basis the name cannot apply to *S. rosulatum*.

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